

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

5 **Listing of Claims:**

Claim 1 (Currently Amended): A signal processing device for processing a ~~passband~~
~~received~~ signal to generate ~~an equalized~~ a sliced signal, comprising:
a ~~passband adaptive~~ an equalizer for generating ~~[[the]]~~ an equalized signal
according to the ~~passband received~~ signal, ~~comprising a feed forward equalizer~~
10 ~~(FFE) and a feedback equalizer (FBE); and;~~
a multilevel quantizer coupled with the ~~passband adaptive~~ equalizer for selectively
utilizing a first amount of one or more thresholds or a second amount of one or
more thresholds ~~a single predetermined threshold or a plurality of multiple~~
~~predetermined thresholds~~ to quantize the equalized signal in order to generate
15 ~~[[a]]~~ the sliced signal, wherein the first amount is different from the second
amount[.]; and
a control logic for controlling the multilevel quantizer to quantize the equalized
signal by the first amount of threshold/thresholds or the second amount of
threshold/thresholds;
20 wherein the control logic controls the multilevel quantizer by executing the
following steps:
comparing the equalized signal with a predetermined level for a first difference;
comparing the equalized signal with a predetermined constant for a second
difference;
25 controlling the multilevel quantizer to quantize the equalized signal by the first
amount of threshold/thresholds for the sliced signal, in the case of the first
difference and the second difference having the same sign (positive/negative);
and

controlling the multilevel quantizer to quantize the equalized signal by the
second amount of threshold/thresholds for the sliced signal, in the case of the
first difference and the second difference having different signs
(positive/negative).

5

Claim 2 (Currently Amended): The device of claim 1 wherein the ~~passband-adaptive~~
equalizer comprises a feed-forward equalizer (FFE), a feed-back equalizer (FBE),
and an adder coupled respectively with the FFE and the FBE for outputting the
equalized signal according to signals outputted from the FFE and the FBE.

10

Claim 3 (Currently Amended): The device of claim 1 further comprising:
a derotator coupled between the ~~passband-adaptive~~-equalizer and the multilevel
quantizer for derotating the equalized signal and inputting the derotated
equalized signal into the multilevel quantizer; and
15 a rotator coupled between the multilevel quantizer and the ~~passband-adaptive~~-
equalizer for rotating the sliced signal outputted from the multilevel quantizer
and inputting the rotated sliced signal into the ~~passband-adaptive~~-equalizer.

20

Claim 4 (Currently Amended): The device of claim 3 wherein the rotator is coupled with
the FBE a feed-back equalizer of the equalizer for rotating the equalized sliced
signal, and the rotated sliced signal is a passband signal.

Claims 5-7 (Cancelled)

25

Claim 8 (Currently Amended): The device of claim [[7]] 1 wherein the predetermined
constant is determined by a constant modulus algorithm.

Claim 9 (Currently Amended): The device of claim [[5]] 1 wherein the control logic

controls the multilevel quantizer according to the following steps ~~a mixture~~
~~method, the method comprises:~~
comparing the equalized signal with a predetermined level corresponding to the
value of the sliced signal for a first difference;
5 comparing the equalized signal with a predetermined constant for a second
difference; and
controlling the multilevel quantizer to quantize the equalized signal by the single
predetermined first amount of threshold/thresholds for the sliced signal, in the
case of the first difference being less than a predetermined value threshold,
10 ~~or/and~~ and the first difference and the second difference have the same sign
(positive/negative); and
~~otherwise,~~ controlling the multilevel quantizer to quantize the equalized signal by
the plurality of multiple predetermined second amount of threshold/thresholds
for the sliced signal, in the case of the first difference being larger than the
15 predetermined value and the first difference and the second difference have
different signs (positive/negative).

Claim 10 (Cancelled)

20 Claim 11 (Original): The device of claim 1 wherein the sliced signal output by the
multilevel quantizer has a plurality of bits.

Claim 12 (New): A signal processing device for generating a sliced signal according to a
received signal, comprising:
25 an equalizer for generating an equalized signal according to the received signal;
a quantizer, coupled to the equalizer, for generating the sliced signal according to
the equalized signal and a first amount of threshold/thresholds when a first slice
mode is applied, and generating the sliced signal according to the equalized

signal and a second amount of threshold/thresholds when a second slice mode is applied; and

a control logic, coupled to the quantizer, for controlling the quantizer to apply the first slice mode or the second slice mode through executing the following steps:

5 subtracting the equalized signal from a predetermined level to obtain a first value;

determining whether the quantizer is in a first status or a second status according to the first value;

10 if the quantizer is in the first status, controlling the quantizer to apply the first slice mode; and

if the quantizer is in the second status, controlling the quantizer to apply the second slice mode;

wherein the first amount of threshold/thresholds is different from the second amount of threshold/thresholds.

15

Claim 13 (New): The signal processing device of claim 12, wherein the control logic further executes the following step:

determining whether the first value is less than a predetermined value, so as to determine that the quantizer is in the first status or second status.

20

Claim 14 (New): The signal processing device of claim 12, wherein the control logic further executes the following steps:

subtracting the equalized signal from a predetermined constant to obtain a second value; and

25 comparing the first value with the second value, so as to determine whether the quantizer is in the first status or second status.

Claim 15 (New): The signal processing device of claim 14, wherein the control logic

compares the first value with the second value, so as to determine whether the first and second values have the same attribute and thereby determine that the quantizer is in the first status or second status.

- 5 Claim 16 (New): The signal processing device of claim 12, wherein the first status represents that the sliced signal is substantially correct, the second status represents that the sliced signal is substantially incorrect, and the first amount of threshold/thresholds is less than the second amount of threshold/thresholds.
- 10 Claim 17 (New): A signal processing method for generating a sliced signal according to a received signal, comprising:
generating an equalized signal according to the received signal;
generating the sliced signal according to the equalized signal and a first amount of threshold/thresholds when a first slice mode is applied, and generating the
15 sliced signal according to the equalized signal and a second amount of threshold/thresholds when a second slice mode is applied; and
applying one of the first slice mode and the second slice mode according to the following steps:
subtracting the equalized signal from a predetermined level to obtain a first
20 value;
determining whether the sliced signal is substantially correct or substantially incorrect according to the first value;
if the sliced signal is substantially correct, applying the first slice mode; and
if the sliced signal is substantially incorrect, applying the second slice mode;
25 wherein the first amount of threshold/thresholds is different from the second amount of threshold/thresholds.

Claim 18 (New): The method of claim 17, further comprising the following step:

determining whether the first value is less than a predetermined value, so as to determine that the sliced signal is substantially correct or substantially incorrect.

Claim 19 (New): The method of claim 17, further comprising the following steps:

- 5 subtracting the equalized signal from a predetermined constant to obtain a second value; and
 comparing the first value with the second value, so as to determine that the sliced signal is substantially correct or substantially incorrect.

10 Claim 20 (New): The method of claim 19, further comprising:

 comparing the first value with the second value, so as to determine whether the first and second values have the same attribute and thereby determine that the sliced signal is substantially correct or substantially incorrect.

15